

## REMARKS

Reconsideration of the above-identified patent application is respectfully requested.

Claims 1, 4, 9, and 12 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0148972 to Krutchinsky et al. (Krutchinsky).

Claims 2, 3, 6, 8, 10, 11, 14, and 16-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Krutchinsky in view of U.S. Patent No. 6,707,035 to Hughey (Hughey).

Claims 5, 7, 13, and 15 stand objected to as being dependent upon a rejected base claim.

In regard to claim 1, the Examiner rejected this claims under 35 U.S.C. §102(b) as being anticipated by Krutchinsky. Claim 1 has been amended to recite "electronically operating a laser steering assembly to move the focus of the laser beam over the MALDI sample." Krutchinsky fails to disclose "electronically operating a laser steering assembly," as recited in amended claim 1. Accordingly, claim 1 is believed to be in condition for allowance.

In regard to claim 9, the Examiner rejected this claim under 35 U.S.C. §102(b) as being anticipated by Krutchinsky. Krutchinsky discloses:

"Referring now to FIG. 2, the MALDI pulsed ionizer 12 includes a laser 20 configured to pulse a sample located on a substrate 22. Any pulsed laser that can produce ions from a sample for mass spectrometry can be used. The laser 20 is preferably a nitrogen laser. As known in the art, the laser may be focused at the sample on the substrate 22 by various optical components, examples of which are shown in FIGS. 2 and 6. A suitable laser is the VSL-337 Nitrogen Laser manufactured by Laser Science, Inc. of Franklin, MA which operates at a repletion rate of 10-20 Hz. The laser 20 can also be a Nd:YAG laser. In FIG. 2, the laser 20 is focused on the sample through a lens 24 and a mirror 26. Preferably the lens collimates the laser beam and has a focal length of about 1 mm to about 1 meter, preferably about 50 cm. The mirror 26 directs the collimated laser beam through a window 25 towards the surface of the substrate 22 at an angle of about 10 degrees to about 80 degrees, preferably about 60 degrees to the normal of the substrate 22. Preferably the laser beam has a laser spot diameter on the surface of a sample from about 0.3 mm to about 0.5 mm. Preferably, the power density of laser radiation in the spot is about

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$10^7 \text{ W/cm}^2$ . The mirror 26 is preferably configured to be 'wobbled' in order to scan the sample with the laser beam. Alternatively as shown in FIG. 6, the laser 20 can be focused on the sample located on the substrate 22 through an optical fiber 28." (Paragraph 28).

The Examiner concludes that "[i]t is inherent [in Krutchinsky] that a processing unit is used to operate the laser source and control the steering of the laser beam over the sample." "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Hansgirg v. Kemmer*, 102 F.2d 212, 40 U.S.P.Q. 665, 667 (C.C.P.A. 1939); *In re Oelrich and Divigard*, 666 F.2d 578, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981). Accordingly, it cannot be said that the system of Krutchinsky inherently includes a processing unit to operate the mirror 26. Krutchinsky simply discloses that a "mirror 26 is preferably configured to be 'wobbled,'" but is silent as to how the mirror 26 is "wobbled." Because, as described in the Applicants' specification, "[i]n typical experiments, the operator manually or remotely moves the sample around beneath the laser beam's focus," one of ordinary skill in the art would arguably equate a mirror "configured to be 'wobbled,'" as a mirror capable of manual movement and not as a processing unit controlled laser steering system. A processing unit controlled laser steering system is neither inherent nor obvious in light of the teachings of Krutchinsky. For at least these reasons, Krutchinsky does not anticipate claim 9 and, accordingly, claim 9 is believed to be allowable.

In regard to claim 17, the Examiner rejected this claim under 35 U.S.C. §103(a) as being unpatentable over Krutchinsky in view of Hughey. The rule of law for a finding of obviousness under 35 U.S.C. § 103(a) was reiterated recently by the Court of Appeals for the Federal Circuit as follows, "[w]hen patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching,

motivation, or suggestion to select and combine the references relied on as evidence of obviousness." *In re Lee*, 277 F.3d 1338 at 1343, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002); See also *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339 at 1351-52, 60 USPQ2d 1001 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references," a question of fact drawing on the Graham factors). The Federal Circuit expounded upon the necessity of finding some teaching or motivation to combine the references *in the references themselves* concluding that "[t]he factual inquiry whether to combine references must be thorough and searching." *In re Lee*, 61 U.S.P.Q.2d at 1433 (Fed. Cir. 2002). The teaching or suggestion to make the claimed combination *must be found in the prior art*, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

In this regard, there is no motivation to combine Krutchinsky and Hughey because Hughey teaches away from such a combination. Krutchinsky describes a "matrix assisted laser desorption device." (Paragraph 026). Hughey describes an accelerator mass spectrometry (AMS) system and teaches that:

"In the MALDI technique, the sample is imbedded in a solid matrix, typically organic acid. The analytes are subsequently vaporized and ionized by pulsed laser irradiation, with the goal of retaining the analyte molecular form. This differs from the goal of the present invention, which is to convert selected chemical elements present in the analyte to a common form. A potential

disadvantage of MALDI as the initial step of the present invention is the production of background organic molecules from the matrix that may limit the sensitivity achievable with the AMS." (Col. 3, ll. 54-64)

Hughey discloses that operation of a MALDI "differs from the goal of the present invention." Based on the teaching of Hughey, one of ordinary skill in the art would not be motivated to combine the MALDI system described in Krutchinsky with the AMS system described in Hughey. Accordingly, there is no motivation to combine Krutchinsky with Hughey because Hughey clearly teaches away from such a combination. MPEP §2145 X.D.2 specifically forbids such a combination because "[i]t is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)."

Further, even if Krutchinsky could be properly combined with Hughey, an assertion that the Applicant strongly disagrees with, neither Krutchinsky nor Hughey disclose "an electronically-controlled mirror array," as recited in claim 17. Both Krutchinsky and Hughey are devoid of any teaching regarding how the "mirror 26" or "moving mirrors," respectively, are actually "wobbled" or otherwise moved. The typical methodology used by MALDI mass spectrometer operators is to manually move the sample around beneath the laser beam's focus. Therefore it would not be obvious to one of ordinary skill in the art, based on the teachings of Krutchinsky and/or Hughey, to electronically control a mirror array. For at least these reasons, neither Krutchinsky, nor Hughey nor any combination render claim 17 §103(a) obvious and, accordingly, claim 17 is believed to be allowable.

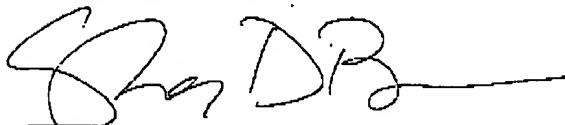
In regard to claim 5 and 13, the Examiner objected to these claims as being dependent upon a rejected base claim, but indicated that claim 5 and 13 would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 has been amended to include the limitations of claim 1. Claim 13 has been amended to include the limitations of claim 9. Accordingly, claims 5 and 13 are believed to be in condition for allowance.

Claims 5 and 13 have been amended. For at least the reasons discussed above, Applicant believes that claims 1, 9 and 17 are in condition for allowance. Because claims 2-4 and 6-8 depend from claim 1, claims 10-12 and 14-16 depend from claim 9, and claims 18 and 19 depend from claim 17, these claims are also believed to be in condition for allowance. Claims 1-19 are accordingly in condition for allowance, and such action is solicited.

Respectfully submitted,



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